Date: Fri, 12 Aug 94 09:28:35 PDT

From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>

Errors-To: Info-Hams-Errors@UCSD.Edu

Reply-To: Info-Hams@UCSD.Edu

Precedence: Bulk

Subject: Info-Hams Digest V94 #904

To: Info-Hams

Info-Hams Digest Fri, 12 Aug 94 Volume 94 : Issue 904

Today's Topics:

CHU Digital Transmission Format? orbs\$224.21.amsat orbs\$224.amsat

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu> Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu> Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available (by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: Fri, 12 Aug 1994 02:38:38 GMT

From: newsflash.concordia.ca!nstn.ns.ca!cs.dal.ca!cfn.cs.dal.ca!aa770@uunet.uu.net

Subject: CHU Digital Transmission Format?

To: info-hams@ucsd.edu

Robert G. Schaffrath (RGS@gfimda.UUCP) wrote:

- : I read here recently that CHU in Canada digitally broadcasts the time between
- : the 30 and 40 second marks. Does anyone on here know the format of the data? I
- : recalled that the encoding is Bell 103 (300 baud) so I tried hooking up an old
- : Hayes Smartmodem 1200 (which was designed with Hams in mind) to see if I could
- : receive anything at 300 baud FSK. No luck.

: Thanx!

- : * Robert G. Schaffrath, N2JTX * Internet: rgs%wpmax2%gfimda@uunet.uu.net *
- : * Maxwell House Coffee Company * Phone: 914-335-2777 *
- : ************************************

Hello Rob not sure if I have the answer you are looking for but I do have some info CHU transmitts from Ottawa Canada on 3330 KHz @ 3KW 7335 KHz @ 10 KW and 14670 KHz @ 3 KW it sends time codes using NRC (ASC II) FSK Time Code at the 60 th minute of each hour at 300 baud . It also identifies in voice every other minute even minutes in English and odd minutes En Francais I have the breakdown as well of the FSK sequence but it is difficult to post. I mostly use the station as propagation indicator to the west keeping in mind that 10 kwatts sure punches through nicely as compared to my 100 watts 73's de VE1BT.... --

| Robert Harplle Net: aa770@cfn.cs.dal.ca | Callsign VE1BT AX.25 VE1BT@#VE1BBS.NS.CA | Locator FN84il | Dartmouth, Nova Scotia, Canada | |

Date: 12 Aug 94 14:02:00 GMT From: news-mail-gateway@ucsd.edu

Subject: orbs\$224.21.amsat To: info-hams@ucsd.edu

NASA 2-Line keps attached as file

begin 0666 ORBS.2L

M4T(@2T504R!`(\$%-4T%4("`D3U)"4RTR,CON3@T*,DQI;F4@3W)B:71A;"!% M;&5M96YT<R`R,C0N04U3050-"@T*2%(@04U3050@3U)"251!3"!%3\$5-14Y4 M4R!&3U(@04U!5\$554B!3051%3\$Q)5\$53(\$E.(\$Y!4T\$@1D]234%4#0I&4D]-M(%=!-5%'1"!&3U)4(%=/4E1(+%18(\$%U9W5S="`Q,BP@,3DY-`T*0DE\$.B`DM3U) "4RTR, CON3@T*#0I\$14-/1\$4@, BU, 24Y%(\$5, 4T544R!7251((%1(12!& M3TQ,3U=)3D<@2T59.@T*,2!!04%!054@,#`@(#`@(#`@0D)"0D(N0D)"0D)" MOD(@("Y#OT-#OT-#OR'@,#'P,#'M,"'@,#'P,#'M,"'P("!\$1\$1:#OHR(\$%! M04%!(\$5%12Y%145%(\$9&1BY&1D9&(\$='1T='1T<@2\$A(+DA(2\$@@24E)+DE) M24D@2DHN2DI*2DI*2DI+2TM+2UH-"DM%63H@02U#051!3\$]'3E5-(\$(M15!/ MOTA424U%(\$,M1\$5#05D@1"U%3%-%5\$Y532!%+4E.OTQ)3D%424].(\$8M4D%! M3@T*1RU%OT-%3E1224-)5%D@2"U!4D=015))1T5%(\$DM34Y!3D]-(\$HM34Y-M3U1)3TX@2RU/4D))5\$Y532!:+4-(14-+4U5-#0H-"E1/(\$%,3"!2041)3R!! M34%415524R!"5`T*#0I!3RTQ,`T*,2`Q-#\$R.54@.#,P-3A"("`@.30R,34N M,C(X,#4S,3`@+2XP,#`P,#,P,B`@,#`P,#`M,"`@,3`P,#`M,R`P("`R.34R M#OHR(#\$T,3(Y("`R-RXP,#`Y(#,Q-"XX,CDP(#8P,C8R-#`@,3DY+C4S,C8@ M,3(P+C8W-C0@(#(N,#4X.#\$X-S8@.#,W-3,-"E5/+3\$Q#0HQ(#\$T-S@Q52`X M-#`R,4(@("`Y-#(R,2XU-30X-SDT."`@+C`P,#`P,#4S("`P,#`P,"TP("`Q M-C<X,2TT(#'@(#<Q-34-"C(@,30W.#\$@(#DW+C<X-34@,C,S+C<W.3D@,#'Q M,CDS,B'@.3<N,S'Y."'R-C(N.34W-R'Q-"XV.3(S-3,V.34U.#\$T-@T*4E,M M, 3`0, 3\$-"C\$@, 3@Q, CE5(#@W, #4TO2`@(#DT, C(Q+C8U. #\$V, #, U("`N, #`P

M,#`P,C`@(#`P,#`P+3`@(#4T,S<Q+34@,"`@.3,T,PT*,B`Q.#\$R.2`@.#(N M.3(V,2'R.#DN,S(R-R'P,#\$P,C\$Y(#(S-"XP,#\$X(#\$R-BXP,3@Y(#\$S+C<R M,S,Y.#,X,S4W,C0P#0I!3RTQ,PT*,2`Q.3(Q-E4@.#@P-3%"("`@.30R,C\$N M,3<W-3`X.#8@+2XP,#`P,#\$V-R`@,#`P,#`M,"`@,3`P,#`M-"`P("`Y-#,P M#OHR(#\$Y,C\$V("`U-RXW-3DR(#(S-RXU,#4S(#<R,C,U.3<@,SOW+C8V-C4@ M("`Q+COT-30@(#(N,#DW,C4Q-C4@-#<Q,C(-"D9/+3(P#OHQ(#(P-#@P52`Y)))))M,#`Q,T,@("`Y-#(R,BXP,3`Q-3`Q,"`M+C`P,#`P,#`X("`P,#`P,"TP("`U M.#DP-2TT(#`@(#<Q,C<-"C(@,C`T.#`@(#DY+C`T,S(@("`S+C8W.#0@,#4T M, #`X-R`R, 3<N-#@Y-R`Q, S@N-S, X, B`Q, BXX, S(R-S(P.#(Q, 3`S-PT*04\M M, C\$-"C\$@, C\$P.#=5(#DQ,#`VO2`@(#DT, C(R+C<P,#OV, C@Q("`N,#`P,#`P M.3,@(#`P,#`P+3`@(#@R-C4W+30@,"`@-#DX.OT*,B`R,3`X-R`@.#(N.30T M.2`Q,#(N,S@Q-B`P,#,T-#DX(#(Y-"XS,C<Q("`V-2XT,C@R(#\$S+C<T-30S $M-\#^U$, 3<W, #<X#0I24RTQ, B\Q, PT*, 2`R, 3`X.54@.3\$P, #=!("`@.30R, C\$N)M-S4Y-3DS,C4@("XP,#`P,#`O-R`@,#`P,#`M,"`@,C\$T,C,M-2`P("`W,340 M#OHR(#(Q, #@Y("`X, BXY, COT(#, S, 2XW, 34Y(#`P, C@V, SD@, S(R+C4Q. #`@ M(#, W+C, Y-S@@, 3, N-SOP-#OT, S`Q-S8P, #`-"D%24T5.10T*, 2`R, C8U-%4@ M.3,P,S%"("`@.30R,#4N,#@V,#\$S.34@+2XP,#`P,#\$T,B`@,#`P,#`M,"`@ M,#`P,#`@,"`P("`R-C<R#OHR(#(R-C4T("`@,2XY-3(P("`Y-RXW,SDR(#(Y M,3<Q-C(@,3@V+C@Y,C(@,38W+C(P-3`@(#\$N-#(R,#\$Y-#8@(#\$W,CD-"E5/ M+3\$T#0HQ(#(P-#, W52`Y, #`P-4(@("`Y-#(R, BXR-#<V, S8T."`M+C`P, #`P M,#(T("`P,#`P,"TP("`W-S`T."TU(#`@("`Q-S@-"C(@,C`T,S<@(#DX+C4X M.3`@,S`V+C(X.#(@,#`Q,3<Y,B`@,S4N-#@P-2`S,CON-S\$U."`Q-"XR.3@U M,3,P,S(S-S,0,PT*04\M,38-"C\$@,C`T,SE5(#DP,#`U1"\@(#DT,C(R+C(S M,3(P,C<U("TN,#`P,#`P,C\$@(#`P,#`P+3`@(#@Y,#0V+34@,"`@.#\$U-@T* M,B`R,#0S.2`@.3@N-3DW-R`S,#<N-38R-2`P,#\$R,34W("`S-2XW,C4S(#,R M-"XT-S0Q(#\$T+C(Y.3`U,S,R,C,W,S(T#0I\$3RTQ-PT*,2`R,#0T,%4@.3`P M,#5%("`@.30R,C(N,C4P,C,R-S@@+2XP,#`P,#`Q,"`@,#`P,#`M,"`@,3,R M-3`M-"`P("`X,38W#0HR(#(P-#0P("`Y."XU.34W(#,P-RXY,C\$Y(#`P,3(0 M-#, @(#, U+C<U, S`@, S(T+COT-C\$@, 30N, S`P-#4R.3, R, S<S-#0-"E=/+3\$X M#0HQ(#(P-#0Q52Y,#P-48@("Y-#(R,BXR,C8U,SDX-2M+CP,#P,#S)))M("`P,#`P,"TP("`X,34R-2TU(#`@(#@Q.#8-"C(@,C`T-#\$@(#DX+C4Y-S\$@ M,S`W+C@Y-34@,#`Q,C@R,2`@,S4N-#(P-2`S,CON-S@S,B`Q-"XS,#`Q.3\$U M, 3(S-S, T-OT*3\$M, 3D-"C\$@, C`T-#)5(#DP, #`U1R`@(#DT, C(R+C(W, 3`S)))M-C@S("TN,#`P,#`P,34@(#`P,#`P+3`@(#\$Q,#@V+30@,"`@.#\$T.`T*,B`R M, #0T, B`@.3@N-3DV."`S, #@N, C\$P, B`P, #\$S, #, R("`S-"XW, S, V(#, R-2XT M-CDS(#\$T+C,P,3\$V,#<T,C,W,S8P#0I53RTR,@T*,2`R,34W-54@.3\$P-3!" M("`@.30R,C(N,COP.3<R-38@+2XP,#`P,#`P."`@,#`P,#`M,"`@,3\$V-S,M M-"`P("`U,3DX#0HR(#(Q-3<U("`Y."XT,S(P(#(Y-2XV,S@V(#`P,#@R.#4@ M,3(S+C<T.#D@,C,V+COT.#8@,30N,S8Y,C8S,C(Q-C`X-#0-"DM/+3(S#0HQ M(#(R,#<W52`Y,C`U,D(@("`Y-#(R,BXP-#,T,C8P-"`M+C`P,#`P,#,W("`P M,#`P,"TP("`Q,#`P,"TS(#`@(#0Q-#4-"C(@,C(P-S<@(#8V+C`W.#D@,38W M+C(Q-S(@,#`Q-3,P-B`R-SON,#(Y,2`@.#4N.#DW-R`Q,BXX-C(X-C@V,B`Y M,S<Q-OT*04\M,C<-"C\$@,C(X,C55(#DS,#8QOR`@(#DT,C(R+C(P,COW,30P M("TN,#`P,#`P,S`@(#`P,#`P+3`@(#4U.#\$W+34@,"`@,S\$R,OT*,B`R,C@R M-2`@.3@N-COU-R`R.3<N-#4W,B`P,#`Y-#DW("`U-"X0,S4W(#,P-BXP-S(S M(#\$T+C(W-C,P.30U(#0U,SDS#0I)3RTR-@T*,2`R,C@R-E4@.3,P-C%\$("`@ M.30R,C,N,C,P-S0S,#,@+2XP,#`P,#`P."`@,#`P,#`M,"`@,30V,S8M-"`P M("`S,3(S#0HR(#(R.#(V("`Y."XV-3`W(#(Y."XU,COP(#`P,3`P-S`@(#40

M+C<Y, #, @, S`X+COQ. #\$@, 30N, C<W, S4W-#`@-#4U-#, -"DM/+3(U#OHO(#(R))))M.#, P52`Y,S`V,4@@("`Y-#(R,BXW,S@S-3\$O."`M+C`P,#`P,#4R("`P,#`P M, "TP("TS-#\$Y-RTU(#`@(#,Q-S\$-"C(@,C(X,S`@(#DX+C4U,3`@,CDT+C<P M-#, @, #`Q, C\$Y.2`@, C`N.#`V, R`S, SDN, S8Q, 2`Q-"XR.#`V,#, P.2`T-30X M-OT*, C(X,CQ-"C\$Q,C(X,CA5(#DS,#8Q1B`Q(#DT,C(R+C(T-SOV-S8T("`N M,#`P,#`P,#`@(#`P,#`P+3`@(#\$W.#`Y+30@,"`@,CDP,PT*,B`R,C@R."`@ M.3@N-COV, B`R.3<N-38W-2`P, #\$Q, COY("`S-RXY, 3, R(#, R, BXR.#, W(#\$T M+C(X, #8R, S\$Q(#\$S-#DT#0I.3T%!+3D-"C\$@, 34T, C=5(#@T, 3(S02`@(#DT M, C(R+C<T, C(V, S(S("`N, #`P, #`P-C(@(#`P, #`P+3`@(#4W, 34Y+30@, "`@M.3`Y-OT*,B`Q-30R-R`@.3DN,#0T-2`R-S,N.#4X,"`P,#\$U.3,Q("`V-BXS M-3(Q(#(Y,RXY,S\$Y(#\$T+C\$S-C,T,S(P-#DW.38U#0I.3T%!+3\$P#0HQ(#\$V M.38Y52`X-C`W,T\$@("`Y-#(R,BXW.#@Y-SOT,R`@+C`P,#`P,#\$U("`P,#`P $\label{eq:main_main_substitute} \texttt{M,"TP("`R-}\#<\texttt{U-2TT(}\#\texttt{`@(}\#\texttt{OP-}\#(-"C(@,38Y-CD@(}\#\texttt{DX+C4P.3$@,C,P+C$R}$ M-30@,#`O,S\$S-B`O-C4N-3@X,R`O.30N-38W-"`O-"XR-#DP,300,#00,#(W M.`T*3454+3(0,3<-"C\$@,3@X,C!5(#@X,#`UO2`@(#DT,C(S+C`X,C(V-#4V M("`N, #`P, #`P-#`@(#`P, #`P+3`@(#(R-#\$W+30@, "`@, S8S, @T*, B`Q.#@RM, "`@.#(N-3,W,B`R,CON.3\$Q.2`P, #\$W.#, Y("`S,2XU.3,T(#,R."XV,C@W M(#\$S+C@T-S\$Y-C4R,S(Y.34Y#0I-150M,R\R#0HQ(#\$Y,S,V52`X.#`V-\$\$@ M("`Y-#(R,BXO-SDO,C@V-"`@+C`P,#`P,#40("`P,#`P,"TP("`0,#`P,"TS M(#`@(#,Q,3,-"C(@,3DS,S8@(#@R+C4T,C`@,C@U+COX,#D@,#`Q.#(P-"`Q M, C4N, #<V, 2`R, S4N, C`U-B`Q, RXQ-CDV. #\$Q, C(Y, #, V. OT*3D]!02TQ, OT* M, 2`Q.34S, 54@.#@P.#E!("`@.30R, C(N.#`W, CDP, #(@("XP, #`P, #`X-"`@ $M, \#^P, \#^M, \#^Q-S^R, C(M-\#^P(\#^W, C< W\#OHR), \#^Y-3, Q(\#^Y.2XQ-S4Y), \#^Q$ M,RXP-C8V(#`P,3\$Y-C4@,SOT+CDT-C8@(#\$U+C\$S-3(@,30N,3,P,#DS,#\$S M,#(X-3`-"DU%5"TR+S\$X#0HQ(#\$Y.#4Q52`X.3`Q.\$\$@("`Y-#(R,BXW,3@Q M-C\$X-R`@+C`P,#`P,#8R("`P,#`P,"TP("`T,C`T-2TT(#`@(#,Q,C0-"C(@ M, 3DX-3\$@(#@R+C4R, #`@, 3`P+C0U-3, @, #`Q-3@V, "`@-S0N, C`P, 2`R.#8N M, #DP, B`Q, RXX-#, W, #8Q-3(W-3(S.0T*3454+3, 0, PT*, 2`R, #, P-54@.#DP M.#9!("`@.30R,C,N,C(W,C,Q-30@("XP,#`P,#`T-"`@,#`P,#`M,"`@,3`P $M, #^M, R^P("^Q, 3, W#0HR(#(P, S^U("^X, BXU-#4Y(#(S, 2XY, #DY(#^P, #8R) + P) + P)))$ M, S8@, 34V+C8V.3D@, C`S+COV, C\$@, 3, N, #OT, #DW.#<R, S`P-S`-"DU%5"TR M+S\$Y#0HQ(#(P-C<P52`Y,#`U-T\$@("`Y-#(R,BXR,C@X,34R,R`M+C`P,#`P M, #<U("`P, #`P, "TP("TX, #\$0-RTT(#`@(#@0-3@-"C(@, C`V-S`@(#@R+C4T M-C@@,38U+C4T-C4@,#`Q-C<Y.2`@(#\$N,C(S."`S-3@N.#DV,2`Q,RXX-#\$X M-S8X.3(P.#`Y-`T*1EDM,2\R#0HO(#(P-S@X52`Y,#`X,4\$@("`Y-#(R,BXR M, S8W.#, V, B`M+C`P, #`P, COT("`P, #`P, "TP("TO, S, O.2TS(#`@("`S-C, -M"C(@,C`W.#@@(#DX+C@S-C\$@,COP+C8U,SO@,#`Q-#<U,"`R,C`N.#\$R.2`Q M,SDN,3DQ,R'Q-"XP,3,T-S8W-#(P,3(W,PT*3454+3(O,C'-"C\$@,C'X,C95 M(#DP, #@V02`@(#DT, C(R+C\$X-30S-S@Q("`N, #`P, #`P-#(@(#`P, #`P+3`@ M(#(T-#(R+30@, "`@.#(S-PT*, B`R, #@R-B`@.#(N-3(V.2`Q, #, N, #(Y-R`P M,#\$Q.#DW(#(U.2XS.#`Y(#\$P,"XV,#\$Q(#\$S+C@S-3@W,S<U,3DU,C(T#0I-M150M,R\T#0HQ(#(Q,C,R52`Y,3`S,\$\$@("`Y-#(R,2XX,C8Y,C`X,2`@+C`P M,#`P,#4Q("`P,#`P,"TP("`Q,#`P,"TS(#`@(#<R,C\$-"C(@,C\$R,S(@(#@R M+C4T,SD@,3,Q+C8X,S`@,#`Q-#<Q,B`@-3(N.3,X,B`S,#<N,S`W-"`Q,RXQ M-COV, S@X, 3\$U.#00, PT*3D] !02T0, @T*, 2`R, 3(V, U4@.3\$P, S)! ("`@.30R)M,C(N-S<Y-3DS-C8@("XP,#`P,#\$U-2`@,#`P,#`M,"`@.#@V-C@M-"`P("`Q M,S\$Y#0HR(#(Q,C8S("`Y."XV,34V(#(T.2XS-#@S(#`P,30P-#,@(#<X+C`W M, S0@, C@R+C(P, 3@@, 30N, C(T, S<V, #<Q-C@R-C<-"DU%5"TS+S4-"C\$@, C\$V

M-355(#DQ,#4V02`@(#DT,C(P+C4U.3,P,3(Y("`N,#`P,#`P-3\$@(#`P,#`P M+3`@(#\$P,#`P+3,@,"`@-S,P-`T*,B`R,38U-2`@.#(N-34S."`@-SDN-S8T M-2`P,#\$T-S,W("`V-"XP,#(P(#(Y-BXR-C(P(#\$S+C\$V.#,S-#\$P,30S,S4W M#0I-150M, B\R, 0T*, 2`R, C<X, E4@.3, P-35! ("`@.30R, C\$N.3`T, COR.3\$@ M+2XP, #`P, #`P-B`@, #`P, #`M, "`M, 3DT, C@M-"`P("`S, COP#0HR(#(R-S@R M("`X,BXU-#DY(#\$V,RXX-S\$S(#`P,COS,3,@(#<T+C@R,C,@,C@U+C4V,C(@ M, 3, N. #, P, 3\$R-#(@-#<U, 3`-"E!/4T%4#0HQ(#(R.#(Y52`Y,S`V,4<@("`YM-#(R,BXV-SOS.3(X,"`@+C`P,#`P,#\$T("`P,#`P,"TP("`R,S\$V-BTT(#`@ M(#,P-3@-"C(@,C(X,CD@(#DX+C8T-C@@,CDX+C`P-#\$@,#`Q,3`V,B`@,SDN M-CDV.2`S,C`N-3`R,2`Q-"XR.#`S-C\$P."`T-30W.`T*34E2#0HQ(#\$V-C`Y M52`X-C`Q-T\$@("`Y-#(R,2XY,S0X-SDV,B`@+C`P,#`Q.3@Y("`P,#`P,"TP M("`S-#`T-"TT(#`@(#<P-#`-"C(@,38V,#D@(#40+C8T.#<@,C<W+C4P-C\$@) $M, \#^P, 3, S-"^R, \#4N, \#8V-2^Q-34N, \#(U-"^Q-2XU-C<U-C8W, \#0X-\#, Y-^T*$ M2%5"0D0%#0H0(#(P-3@P52`Y,#`S-T(@("`Y-#(R,2XY,38W-S8T-"`@+C`P M,#`P,CDS("`P,#`P,"TP("`Q,SDU-"TT(#`@(#4Q-C\$-"C(@,C`U.#`@(#(X M+COV.3D@,C4P+C@S-#(@,#`P-3<W-B`R.#DN-#(T-B`@-S`N-3<Q."`Q-"XY M, #8U, 38U, 2`S-S0Q, `T*1U) / #0HQ(#(Q, C(U52`Y, 3`R-T(@("`Y-#(R, BXR)))))M,C`Q-S@S,"`@+C`P,#`Q,SDP("`P,#`P,"TP("`R-C4S-RTT(#`@(#\$R-#,-M"C(@,C\$R,C4@(#(X+COV,S\$@,C\$V+CDX,SO@,#`P,S8V.2`Q,3,N,30R-2`R M-#8N.34V-B`Q-2XT,3\$R-3@Q,"`V-3(X.0T*54%24PT*,2`R,3<P,54@.3\$P M-C-"("`@.30R,C,N,C(R,C\$U-S0@+2XP,#`P,C`U-2`@,#`P,#`M,"`M,34X M,30M,R`P("`U-S\$W#0HR(#(Q-S`Q("`U-BXY.#8Q(#(Y."XU,3(X(#`P,#4S $M, \#(0, 3R+C(R-S(0,C0W+CDR-C00,30N.38U-C00,\#^0,-3D0-S<-"B]\%6^T*$ 1&C(@

end

Date: 12 Aug 94 14:00:00 GMT From: news-mail-gateway@ucsd.edu

Subject: orbs\$224.amsat To: info-hams@ucsd.edu

AMSAT format keps attached as file

begin 0666 ORBS.224

M93H@("`@("`M,RXP,F4M,#8@<F5V+V1A>5XR#0I%<&]C:"!R978Z("`@("`@ M("`@("`@.#,W-OT*OVAE8VMS=6TZ("`@("`@("`@("`@("`R.#8-"@T*4V%T M96QL:71E.B!53RTQ,0T*0V%T86Q09R!N=6UB97(Z(#\$T-S@Q#0I%<&]C:"!T M:6UE.B`@("`@(#DT,C(0+C4U-#@W.30X#0I%;&5M96YT('-E=#H@("`@(#<0 M-OT*26YC;&EN871I;VXZ("`@("`@(#DW+C<X-34@9&5G#0I202!09B!N;V1E M.B'@("'@("'R,S,N-S<Y.2!D96<-"D5C8V5N=")I8VET>3H@("'@,"XP,#\$R M.3, R#0I!<F<@; V8@<&5R:6=E93H@("`@.3<N,S`Y."!D96<-"DUE86X@86YO M;6%L>3H@("`@(#(V,BXY-3<W(&1E9PT*365A;B!M;W1I;VXZ("`@,30N-CDR M,S4S-CD@<F5V+V1A>0T*1&5C87D@<F%T93H@("`@("`@(#4N,V4M,#<@<F5V M+V1A>5XR#0I%<&]C:"!R978Z("`@("`@("`@("`U-3@Q-`T*0VAE8VMS=6TZ M("'@("'@("'@("'S-C8-"@T*4V%T96QL:71E.B!24RTQ,"\Q,0T*0V%T M86Q09R!N=6UB97(Z(#\$X,3(Y#0I%<&]C:"!T:6UE.B`@("`@(#DT,C(Q+C8U M.#\$V,#,U#0I%;&5M96YT('-E=#H@("`@(#DS-`T*26YC;&EN871I;VXZ("`@ M("`@(#@R+CDR-C\$@9&5G#0I202!09B!N;V1E.B`@("`@("`R.#DN,S(R-R!D M96<-"D5C8V5N=") I8VET>3H@("`@,"XP,#\$P,C\$Y#0I!<F<@;V8@<&5R:6=E M93H@("`R,SON,#`Q."!D96<-"DUE86X@86Y0;6%L>3H@("`@(#\$R-BXP,3@Y M(&1E9PT*365A;B!M;W1I;VXZ("`@,3,N-S(S,SDX,S@@<F5V+V1A>0T*1&5C M87D@<F%T93H@("`@("`@(#(N,&4M,#<@<F5V+V1A>5XR#0I%<&]C:"!R978Z M"@T*4V%T96QL:71E.B!!3RTQ,PT*0V%T86Q09R!N=6UB97(Z(#\$Y,C\$V#0I% M<&]C:"!T:6UE.B`@("`@(#DT,C(Q+C\$W-S4P.#@V#0I%;&5M96YT('-E=#H@ M("`@(#DT,PT*26YC;&EN871I;VXZ("`@("`@(#4W+C<U.3(@9&5G#0I202!0 M9B!N;V1E.B'@("'@("'R,S<N-3'U,R!D96<-"D5C8V5N=')I8VET>3H@("'@ M, "XW, C(S-3DW#0I!<F<@; V8@<&5R:6=E93H@("`S-#<N-C8V-2!D96<-"DUE M86X@86Y0;6%L>3H@("`@("`@,2XT-#4T(&1E9PT*365A;B!M;W1I;VXZ("`@ M(#(N,#DW,C4Q-C4Q<F5V+V1A>0T*1&5C87DQ<F%T93HQ("`Q("`M,2XV-V4M))M,#8@<F5V+V1A>5XR#01%<&]C:"!R978Z("`@("`@("`@("`@-#<Q,@T*0VAE M8VMS=6TZ("'@("'@("'@("'S,C4-"@T*4V%T96QL:71E.B!&3RTR,`T* MOV%T86QO9R!N=6UB97(Z(#(P-#@P#0I%<&]C:"!T:6UE.B`@("`@(#DT,C(R M+C`Q,#\$U,#\$P#0I%;&5M96YT('-E=#H@("`@(#<Q,@T*26YC;&EN871I;VXZ M("`@("`@(#DY+C`T,S(@9&5G#0I202!09B!N;V1E.B`@("`@("`@(#,N-C<X M-"!D96<-"D5C8V5N=')I8VET>3H@("`@,"XP-30P,#@W#0I!<F<@;V8@<&5R M:6=E93H@("`R,3<N-#@Y-R!D96<-"DUE86X@86Y0;6%L>3H@("`@(#\$S."XW M,S@R(&1E9PT*365A;B!M;W1I;VXZ("`@,3(N.#,R,C<R,#@@<F5V+V1A>OT* M1&5C87D@<F%T93H@("`@("`@+3@N,&4M,#@@<F5V+V1A>5XR#0I%<&]C:"!R M978Z("`@("`@("`@("`R,3\$P,PT*0VAE8VMS=6TZ("`@("`@("`@("`@("`R M-C4-"@T*4V%T96QL:71E.B!!3RTR,0T*0V%T86Q09R!N=6UB97(Z(#(Q,#@W M#0I%<&]C:"!T:6UE.B`@("`@(#DT,C(R+C<P,#0V,C@Q#0I%;&5M96YT('-E M=#H@("`@(#0Y.`T*26YC;&EN871I;VXZ("`@("`@(#@R+CDT-#D@9&5G#0I2 M02!09B!N;V1E.B`@("`@("`Q,#(N,S@Q-B!D96<-"D5C8V5N=')I8VET>3H@ M("`@,"XP,#,T-#DX#0I!<F<@;V8@<&5R:6=E93H@("`R.30N,S(W,2!D96<-M"DUE86X@86YO;6%L>3H@("`@("`V-2XT,C@R(&1E9PT*365A;B!M;W1I;VXZ M("`@,3,N-SOU-#,T,#4@<F5V+V1A>OT*1&5C87D@<F%T93H@("`@("`@(#DN M, V4M, #<@<F5V+V1A>5XR#0I%<&]C:"!R978Z("`@("`@("`@("`Q-S<P-PT* MOVAE8VMS=6TZ("`@("`@("`@("`@("`S,3`-"@T*4V%T96QL:71E.B!24RTQ M,BQ,PT*0V%T86Q09R!N=6UB97(Z(#(Q,#@Y#0I%<&]C:"!T:6UE.B`@("`@)M(#DT,C(Q+C<U.34Y,S(U#0I%;&5M96YT('-E=#H@("`@(#<Q-OT*26YC;&EN M871I; VXZ("`@("`@(#@R+CDR-#0@9&5G#0I202!09B!N; V1E.B`@("`@("`S M,S\$N-S\$U.2!D96<-"D5C8V5N=")I8VET>3H@("`@,"XP,#(X-C,Y#0I!<F<@ M; V8@<&5R:6=E93H@("`S,C(N-3\$X,"!D96<-"DUE86X@86YO;6%L>3H@("`@ M("`S-RXS.3<X(&1E9PT*365A;B!M;W1I;VXZ("`@,3,N-S0P-#0T,S`@<F5V M+V1A>OT*1&5C87D@<F%T93H@("`@("`@(#\$N-V4M,#<@<F5V+V1A>5XR#OI% M<&]C:"!R978Z("`@("`@("`Q-S8P,`T*0VAE8VMS=6TZ("`@("`@("`@ M("`@("`S,3`-"@T*4V%T96QL:71E.B!!4E-%3D4-"D-A=&%L;V<@;G5M8F5R M.B`R,C8U-`T*17!08V@@=&EM93H@("`@("`Y-#(P-2XP.#8P,3,Y-0T*16QE M;65N="!S970Z("`@("`R-C<-"DEN8VQI;F%T:6]N.B`@("`@("`@,2XY-3(P M(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@(#DW+C<S.3(@9&5G#0I%8V-E;G1R M:6-I=DZ("`@(#`N,CDO-S\$V,@T*07)G(&]F('!E<FEG964Z("`@,3@V+C@Y))M,C(@9&5G#0I-96%N(&%N;VUA;'DZ("`@("`Q-C<N,C`U,"!D96<-"DUE86X@ M;6]T:6]N.B'@("'Q+COR,C'Q.30V(')E=B]D87D-"D1E8V%Y(')A=&4Z("'@ M("`@+3\$N-#)E+3`V(')E=B]D87E>, @T*17!08V@@<F5V.B`@("`@("`@("`@M("`O-S(-"D-H96-K<W5M.B`@("`@("`@("`@("`@,C@O#OH-"B]%6`T*4T(@ M2T504R!`(\$%-4T%4("`D3U)"4RTR,CON1`T*3W)B:71A;"!%;&5M96YT<R`@ M,C(T+DU)OU)/4PT*#0I(4B!!35-!5"!/4D))5\$%,(\$5,14U%3E13(\$9/4B!4 M2\$4@34E#4D]30513#0I&4D] - (%=!-5%'1"!&3U)4(%=/4E1(+%18(\$%U9W5S))M="`Q,BP@,3DY-`T*0DE\$.B`D3U)"4RTR,C0N1`T*5\$\@04Q,(%)!1\$E/(\$%-M051%55)3(\$)4#0H-"E-A=&5L;&ET93H@54\M,30-"D-A=&%L;V<@;G5M8F5R M.B`R,#0S-PT*17!08V@@=&EM93H@("`@("`Y-#(R,BXR-#<V,S8T.`T*16QE M;65N="!S970Z("`@("`@,3<-"DEN8VQI;F%T:6]N.B`@("`@("`Y."XU.#DP M(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,S`V+C(X.#(@9&5G#0I%8V-E;G1R M:6-I='DZ("`@(#`N, #`O, 3<Y, @T*07)G(&]F('!E<FEG964Z("`@(#, U+COX))M,#4@9&5G#0I-96%N(&%N;VUA; 'DZ("`@("`S,CON-S\$U."!D96<-"DUE86X@ M;6]T:6]N.B`@(#\$T+C(Y.#4Q,S`S(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@ $M("\hat{0}("TR+C1E+3)W(')E=B]D87E>, @T*17!08V@@<F5V.B^@("^@("^@("^@(")@)$ M,C,W,S\$-"D-H96-K<W5M.B`@("`@("`@("`@("`@,S`Q#0H-"E-A=&5L;&ET M93H@04\M,38-"D-A=&%L;V<@;G5M8F5R.B`R,#0S.OT*17!08V@@=&EM93H@ M("`@("`Y-#(R,BXR,S\$R,#(W-OT*16QE;65N="!S970Z("`@("`X,34-"DEN M8VQI;F%T:6]N.B`@("`@("`Y."XU.3<W(&1E9PT*4D\$@;V8@;F]D93H@("`@ $M("\@.S\W+C4V,C4@9\&5G\#0I\%8V-E;G1R:6-I="DZ("\@(\#\N,\#\Q,C\$U-PT*$ M07)G(&]F('!E<FEG964Z("`@(#,U+C<R-3,@9&5G#0I-96%N(&%N;VUA;'DZ M("'@("'S,CON-#<T,2!D96<-"DUE86X@;6]T:6]N.B'@(#\$T+C(Y.3'U,S,R M(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`@("TR+C%E+3`W(')E=B]D87E>M,@T*17!08V@@<F5V.B`@("`@("`@,C,W,S(-"D-H96-K<W5M.B`@("`@ $M("`@("`@("`@,C@Y#OH-"E-A=&5L;&ET93H@1$\M,3<-"D-A=&%L;V<@;G5M$ M8F5R.B`R,#0T, `T*17!08V@@=&EM93H@("`@("`Y-#(R,BXR-3`R,S(W.`T* M16QE;65N="!S970Z("`@("`X,38-"DEN8VQI;F%T:6]N.B`@("`@("`Y."XU M.34W(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,S`W+CDR,3D@9&5G#0I%8V-E M;G1R:6-I='DZ("`@(#`N,#`Q,C\$T,PT*07)G(&]F('!E<FEG964Z("`@(#,U))M+C<U,S`@9&5G#0I-96%N(&%N;VUA; 'DZ("`@("`S,CON-#0V,2!D96<-"DUE M86X@;6]T:6]N.B`@(#\$T+C,P,#0U,CDS(')E=B]D87D-"D1E8V%Y(')A=&4Z M("`@("`@("TQ+C!E+3`W(')E=B]D87E>,@T*17!08V@@<F5V.B`@("`@("`@M("`@,C,W,SO-"D-H96-K<W5M.B`@("`@("`@("`@("`@("`@,C<V#0H-"E-A=&5LM;&ET93H@5T\M,3@-"D-A=&%L;V<@;G5M8F5R.B`R,#0T,0T*17!08V@@=&EM M93H@("`@("`Y-#(R,BXR,C8U,SDX-OT*16QE;65N="!S970Z("`@("`X,3@- $\verb|M"DEN8VQI;F%T:6]| N.B`@("`@("`Y."XU.3<Q(&1E9PT*4D$@;V8@;F]| D93H@ | Construction | Construc$ M("`@("`@,S`W+C@Y-34@9&5G#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`Q,C@R)

M,OT*07)G(&]F('!E<FEG964Z("`@(#,U+COR,#4@9&5G#0I-96%N(&%N;VUA M; 'DZ("`@("`S,CON-S@S,B!D96<-"DUE86X@;6]T:6]N.B`@(#\$T+C,P,#\$Y M,34Q(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`@("TR+C-E+3`W(')E=B]D M87E>,@T*17!08V@@<F5V.B`@("`@("`@,C,W,S0-"D-H96-K<W5M.B`@ M("`@("`@("`@,CDU#OH-"E-A=&5L;&ET93H@3\$\M,3D-"D-A=&%L;V<@ M;G5M8F5R.B`R,#0T,@T*17!08V@@=&EM93H@("`@("`Y-#(R,BXR-S\$P,S8X M,PT*16QE;65N="!S970Z("`@("`X,30-"DEN8VQI;F%T:6]N.B`@("`@("`Y M."XU.38X(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,S`X+C(Q,#(@9&5G#0I% M(#,T+C<S,S8@9&5G#0I-96%N(&%N;VUA;'DZ("`@("`S,C4N-#8Y,R!D96<-M"DUE86X@;6]T:6]N.B`@(#\$T+C,P,3\$V,#<T(')E=B]D87D-"D1E8V%Y(')A M=&4Z("`@("TQ+C5E+3`W(')E=B]D87E>, @T*17!08V@@<F5V.B`@("`@)M("`@("`@,C,W,S8-"D-H96-K<W5M.B`@("`@("`@("`@("`@,C<X\$\$0\$H-"E-A)) $M=\&5L;\&ET93H@54\M,C(-"D-A=\&\%L;V<@;G5M8F5R.B`R,34W-OT*17!08V@@$ M=&EM93H@("`@("`Y-#(R,BXR-#`Y-S(U-@T*16QE;65N="!S970Z("`@("`U M,3D-"DEN8VQI;F%T:6]N.B'@("'@("'Y."XT,S(P(&1E9PT*4D\$@;V8@;F]D M93H@("`@("`@,CDU+C8S.#8@9&5G#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`P M.#(X-OT*O7)G(&]F('!E<FEG964Z("`@,3(S+C<T.#D@9&5G#0I-96%N(&%N M; VUA; 'DZ("`@("`R,S8N-#0X-B!D96<-"DUE86X@;6]T:6]N.B`@(#\$T+C,V M.3(V,S(R(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`@("TX+C!E+3`X(')E M=B]D87E>,@T*17!08V@@<F5V.B`@("`@("`@("`@,38P.#0-"D-H96-K<W5M M.B`@("`@("`@("`@("`@,S(V#OH-"E-A=&5L;&ET93H@2T\M,C,-"D-A=&%L M; V<@; G5M8F5R.B`R,C`W-PT*17!08V@@=&EM93H@("`@("`Y-#(R,BXP-#,T M,C8P-`T*16QE;65N="!S970Z("`@("`T,30-"DEN8VQI;F%T:6]N.B`@("`@ M("`V-BXP-S@Y(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,38W+C(Q-S(@9&5G M#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`Q-3,P-@T*07)G(&]F('!E<FEG964Z)M("`@,C<T+C`R.3\$@9&5G#0I-96%N(&%N;VUA;'DZ("`@("`@.#4N.#DW-R!D M96<-"DUE86X@;6]T:6]N.B`@(#\$R+C@V,C@V.#8R(')E=B]D87D-"D1E8V%Y M(')A=&4Z("`@("`@("TS+C=E+3`W(')E=B]D87E>,@T*17!08V@@<F5V.B`@M("`@("`@("`@(#DS-S\$-"D-H96-K<W5M.B`@("`@("`@("`@("`@("`@,S\$Q#OH- $M"E-A=&5L;&ET93H@04\M,C<-"D-A=&%L;V<@;G5M8F5R.B`R,C@R-OT*17!0$ M8V@=&EM93H@("`@("`Y-#(R,BXR,#(T-S\$T,`T*16QE;65N="!S970Z("`@M("`S,3(-"DEN8VQI;F%T:6]N.B`@("`@("`Y."XV-#4W(&1E9PT*4D\$@;V8@ M;F]D93H@("`@("`@,CDW+COU-S(@9&5G#OI%8V-E;G1R:6-I='DZ("`@(#`N M,#`P.30Y-PT*07)G(&]F('!E<FEG964Z("`@(#4T+C\$S-3<@9&5G#0I-96%N M(&%N; VUA; 'DZ("`@("`S,#8N,#<R,R!D96<-"DUE86X@;6]T:6]N.B`@(#\$T M+C(W-C,P.30U(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`@("TS+C!E+3`W M(')E=B]D87E>, @T*17!08V@@<F5V.B'@("'@("'@(#0U,SD-"D-H96-K)]M<W5M.B'@("'@("'@("'@,S'P#OH-"E-A=&5L;&ET93H@24\M,C8-"D-A M=&%L;V<@;G5M8F5R.B`R,C@R-@T*17!08V@@=&EM93H@("`@("`Y-#(R,RXR M,S`W-#,P,PT*16QE;65N="!S970Z("`@("`S,3(-"DEN8VQI;F%T:6]N.B`@ M("`@("`Y."XV-3`W(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,CDX+C4R-#`@ $\label{eq:main_section} \mbox{M9\&5G$\#0$I\%8V-E;G1R:6-I='DZ("`@($N,Q,$^W,`T*07)G(\&]F('!E<FEG) }$ M964Z("`@(#4Q+C<Y,#,@9&5G#0I-96%N(&%N;VUA; 'DZ("`@("`S,#@N-#\$X M,2!D96<-"DUE86X@;6]T:6]N.B`@(#\$T+C(W-S,U-SOP(')E=B]D87D-"D1E M8V%Y(')A=&4Z("`@("`TX+C!E+3`X(')E=B]D87E>, @T*17!08V@@<F5V $\label{eq:mbasis} $$M.B`@("`@("`@("`@("`@("`@,C<X))).$$X = $$M.B`@("`@("`@("`@("`@,C<X)).$$$ M#0H-"E-A=&5L;&ET93H@2T\M,C4-"D-A=&%L;V<@;G5M8F5R.B`R,C@S,`T*

M17!08V@@=&EM93H@("`@("`Y-#(R,BXW,S@S-3\$Q.`T*16QE;65N="!S970Z M("'@("'S,3<-"DEN8VQI;F%T:6]N.B'@("'@("'Y."XU-3\$P(&1E9PT*4D\$@ M;V8@;F]D93H@("`@("`@,CDT+C<P-#,@9&5G#0I%8V-E;G1R:6-I='DZ("`@ $M(\#\ N,\#\ Q,C\$Y.0T*07)G(\&]F('!E<FEG964Z("\ @(\#(P+C@P-C,@9\&5G\#0I-$ M96%N(&%N; VUA; 'DZ("`@("`S,SDN,S8Q,2!D96<-"DUE86X@;6]T:6]N.B`@ M(#\$T+C(X,#8P,S`Y(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`@("TU+C)EM+3`W(')E=B]D87E>,@T*17!08V@@<F5V.B`@("`@("`@("`@(#0U-#@-"D-H M96-K<W5M.B`@("`@("`@("`@,C@U#OH-"E-A=&5L;&ET93H@,C(X,C@- $\label{eq:mudal} $$M$"D-A=&%L;V<@;G5M8F5R.B`R,C@R.`T*17!08V@@=&EM93H@("`@("`Y-$$(R)) = $$EM93H@("`@("`Y-$$(R)) = $$EM93H@("`W.Y-$$(R)) = $$EM93H@(W.Y-$$(R)) = $$EM93HW(W.Y-$$(R)) = $$EM93HW(W.Y-$$ M,BXR-#<T-C<V-`T*16QE;65N="!S970Z("`@("`R.3`-"DEN8VQI;F%T:6]N M.B'@("'@("'Y."XV-#8R(&1E9PT*4D\$@;V8@;F]D93H@("'@("'@,CDW+C4V M-S4@9&5G#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`Q,3(T.0T*07)G(&]F('!EM<FEG964Z("`@(#,W+CDQ,S(@9&5G#0I-96%N(&%N;VUA;'DZ("`@("`S,C(N M, C@S-R!D96<-"DUE86X@;6]T:6]N.B`@(#\$T+C(X,#8R,S\$O(')E=B]D87D-M"D1E8V%Y(')A=&4Z("`@("`@+C`P,#`P,#`P(')E=B]D87E>,@T*17!08V@@M<F5V.B'@("'@("'@("'@(#\$S-#D-"D-H96-K<W5M.B'@("'@("'@("'@("'@ M,S`V#0H-"B]%6`T*4T(@2T504R!`(\$%-4T%4("`D3U)"4RTR,C0N5PT*3W)B M:71A;"!%;&5M96YT<R`@,C(T+E=%051(15(-"@T*2%(@04U3050@3U)"251! M3"!%3\$5-14Y44R!&3U(@5T5!5\$A%4B!3051%3\$Q)5\$53#0I&4D]-(%=!-5%' M1"!&3U)4(%=/4E1(+%18(\$%U9W5S="`Q,BP@,3DY-`T*0DE\$.B`D3U)"4RTR $M, CON5PT*5$\@040, (\%) !1$E/($%-051%55)3($)4#0H-"E-A=&5L;&ET93H@$ M3D]!02TY#0I#871A;&]G(&YU;6)E<CH@,34T,C<-"D5P;V-H('1I;64Z("`@ M("`@.30R,C(N-SOR,C8S,C,-"D5L96UE;G0@<V5T.B`@("`@.3`Y#0I);F-L M:6YA=&EO;CH@("`@("`@.3DN,#0T-2!D96<-"E)!(&]F(&YO9&4Z("`@("`@ M(#(W,RXX-3@P(&1E9PT*16-C96YT<FEC:71Y.B`@("`P+C`P,34Y,S\$-"D%R M9R!09B!P97)I9V5E.B'@("'V-BXS-3(Q(&1E9PT*365A;B!A;F]M86QY.B'@ M("`@,CDS+CDS,3D@9&5G#0I-96%N(&UO=&EO;CH@("`Q-"XQ,S8S-#,R,"!R M97809&%Y#0I\$96-A>2!R871E.B`@("`@("`@-BXR92TP-R!R97809&%Y7C(-M"D5P;V-H(')E=CH@("`@("`@("`@(#0Y-SDV#0I#:&5C:W-U;3H@("`@("`@ M("`@("`@(#,Q-PT*#0I3871E;&QI=&4Z(\$Y/04\$M,3`-"D-A=&%L;V<@;G5M]M8F5R.B`Q-CDV.OT*17!08V@@=&EM93H@("`@("`Y-#(R,BXW.#@Y-SOT,PT* M16QE;65N="!S970Z("`@("`X,#0-"DEN8VQI;F%T:6]N.B`@("`@("`Y."XU M,#DQ(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,C,P+C\$R-30@9&5G#0I%8V-E M;G1R:6-I='DZ("`@(#`N,#`Q,S\$S-@T*07)G(&]F('!E<FEG964Z("`@,38U))M+C4X.#,@9&5G#0I-96%N(&%N;VUA;'DZ("`@("`Q.30N-38W-"!D96<-"DUE M86X@;6]T:6]N.B`@(#\$T+C(T.3`Q-#\$P(')E=B]D87D-"D1E8V%Y(')A=&4Z M("`@("`Q+C5E+3`W(')E=B]D87E>, @T*17!08V@@<F5V.B`@("`@("`@M("`@-#\$P,C<-"D-H96-K<W5M.B`@("`@("`@("`@("`@("`@,S`U#0H-"E-A=&5L M;&ET93H@3454+3(0,3<-"D-A=&%L;V<@;G5M8F5R.B`Q.#@R,`T*17!08V@@ M=&EM93H@("`@("`Y-#(R,RXP.#(R-COU-@T*16QE;65N="!S970Z("`@("`S M-C,-"DEN8VQI;F%T:6]N.B`@("`@("`X,BXU,S<R(&1E9PT*4D\$@;V8@;F]D M93H@("`@("`@,C(T+CDQ,3D@9&5G#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`Q)))M-S@S.OT*07)G(&]F('!E<FEG964Z("`@(#,Q+C4Y,S0@9&5G#0I-96%N(&%N M; VUA; 'DZ("`@("`S,C@N-C(X-R!D96<-"DUE86X@;6]T:6]N.B`@(#\$S+C@T M-S\$Y-C4R(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`@("`T+C!E+3`W(')E M=B]D87E>,@T*17!08V@@<F5V.B`@("`@("`@("`@,S(Y.34-"D-H96-K<W5M M.B`@("`@("`@("`@("`@,S(W#OH-"E-A=&5L;&ET93H@3454+3,O,@T*OV%T M86Q09R!N=6UB97(Z(#\$Y,S,V#0I%<&]C:"!T:6UE.B`@("`@(#DT,C(R+C\$W

M.3\$R.#8T#0I%;&5M96YT('-E=#H@("`@(#,Q,OT*26YC;&EN871I;VXZ("`@ M("`@(#@R+C4T,C`@9&5G#0I202!09B!N;V1E.B`@("`@("`R.#4N-#@P.2!D M96<-"D5C8V5N=") I8VET>3H@("`@,"XP,#\$X,C`T#0I!<F<@;V8@<&5R:6=E M93H@("`Q,C4N,#<V,2!D96<-"DUE86X@86YO;6%L>3H@("`@(#(S-2XR,#4V M(&1E9PT*365A;B!M;W1I;VXZ("`@,3,N,38Y-C@Q,3(@<F5V+V1A>0T*1&5C M87D@<F%T93H@("`@("\@(#4N,64M,#<@<F5V+V1A>5XR#0I%<&]C:"!R978Z M("'@("'@("'@("'R.3'S-@T*0VAE8VMS=6TZ("'@("'@("'@("'@("'R.#\$-M"@T*4V%T96QL:71E.B!.3T%!+3\$Q#0I#871A;&]G(&YU;6)E<CH@,3DU,S\$-M"D5P;V-H('1I;64Z("`@("`@.30R,C(N.#`W,CDP,#(-"D5L96UE;G0@<V5T M.B`@("`@-S(W##0I);F-L:6YA=&EO;CH@("`@("`@.3DN,3<U.2!D96<-"E)! M(&]F(&Y09&4Z("`@("`@(#(Q,RXP-C8V(&1E9PT*16-C96YT<FEC:71Y.B`@ M("P+CP,3\$Y-C4-"D%R9R!09B!P97)I9V5E.B@(#,T-"XY-#8V(&1E9PT*)M365A;B!A;F]M86QY.B`@("`@(#\$U+C\$S-3(@9&5G#0I-96%N(&UO=&EO;CH@ M("`0-"X0,S`P.3,P,2!R97809&%Y#0I\$96-A>2!R871E.B`@("`@("`@."XT M92TP-R!R97809&%Y7C(-"D5P;V-H(')E=CH@("`@("`@("`@(#,P,C@U#OI# M:&5C:W-U;3H@("`@("`@("`@("`@(#(X-@T*#0I3871E;&QI=&4Z(\$U%5"TR))))M+S\$X#0I#871A;&]G(&YU;6)E<CH@,3DX-3\$-"D5P;V-H('1I;64Z("`@("`@ M.30R,C(N-S\$X,38Q.#<-"D5L96UE;G0@<V5T.B`@("`@,S\$R#0I);F-L:6YA M=&EO; CH@("`@("`@.#(N-3(P,"!D96<-"E)!(&]F(&YO9&4Z("`@("`@(#\$P)))))M, "XT-34S(&1E9PT*16-C96YT<FEC:71Y.B'@("'P+C'P,34X-C'-"D%R9R!0 M9B!P97)I9V5E.B`@("`W-"XR,#`Q(&1E9PT*365A;B!A;F]M86QY.B`@("`@ M, C@V+C`Y, #(@9&5G#0I-96%N(&UO=&EO; CH@("`Q, RXX-#, W, #8Q-2!R9780 M9&%Y#0I\$96-A>2!R871E.B`@("`@("`@-BXR92TP-R!R97809&%Y7C(-"D5P M;V-H(')E=CH@("`@("`@("`@(#(W-3(S#OI#:&5C:W-U;3H@("`@("`@("`@ M("`@(#(W,OT*#0I3871E;&QI=&4Z(\$U%5"TS+S,-"D-A=&%L;V<@;G5M8F5R)] $\label{eq:m.b.r.star} \texttt{M.B.R.}, \#, \texttt{P-OT} \star \texttt{17!08V@@=\&EM93H@("`@("`Y-\#(R,RXR,C<R,S$U-`T \star \texttt{16QE}))} = \texttt{M.B.R.}, \#, \texttt{P-OT} \star \texttt{17!08V@@=\&EM93H@("`@("`Y-\#(R,RXR,C<R,S$U-`T \star \texttt{16QE}))} = \texttt{M.B.R.}, \#, \texttt{P-OT} \star \texttt{17!08V@@=\&EM93H@("`@("`Y-\#(R,RXR,C<R,S$U-`T \star \texttt{16QE}))} = \texttt{M.B.R.}, \#, \texttt{M.B.R.}, \#, \texttt{M.B.R.}, \#, \texttt{M.B.R.}, \texttt{M.B.R.}$ M;65N="!S970Z("`@("`Q,3,-"DEN8VQI;F%T:6]N.B`@("`@("`X,BXU-#4Y M(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,C,Q+CDP.3D@9&5G#0I%8V-E;G1R M:6-I=DZ("`@(#`N,#`P-C(S-@T*07)G(&]F('!E<FEG964Z("`@,34V+C8V))M.3D@9&5G#0I-96%N(&%N; VUA; 'DZ("`@("`R,#,N-#8R,2!D96<-"DUE86X@ M;6]T:6]N.B`@(#\$S+C`T-#`Y-S@W(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@M("`@("`T+C1E+3`W(')E=B]D87E>, @T*17!08V@@<F5V.B`@("`@("`@("`@("`@M,C,P,#<-"D-H96-K<W5M.B'@("'@("'@("'@,C@T#OH-"E-A=&5L;&ET M93H@3454+3(0,3D-"D-A=&%L;V<@;G5M8F5R.B`R,#8W,`T*17!08V@@=&EM M93H@("`@("`Y-#(R,BXR,C@X,34R,PT*16QE;65N="!S970Z("`@("`X,34-M"DEN8VQI;F%T:6]N.B`@("`@("`X,BXU-#8X(&1E9PT*4D\$@;V8@;F]D93H@ M("`@("`@,38U+C4T-C4@9&5G#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`Q-C<Y M.OT*07)G(&]F('!E<FEG964Z("`@("`Q+C(R,S@@9&5G#OI-96%N(&%N;VUA M; 'DZ("`@("`S-3@N.#DV,2!D96<-"DUE86X@;6]T:6]N.B`@(#\$S+C@T,3@W M-C@Y(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`@("TW+C5E+3`W(')E=B]D M87E>,@T*17!08V@@<F5V.B`@("`@("`@,C`X,#D-"D-H96-K<W5M.B`@ M("`@("`@("`@("`@, SOR#OH-"E-A=&5L;&ET93H@1EDM,2\R#0I#871A;&]G M(&YU;6)E<CH@,C`W.#@-"D5P;V-H('1I;64Z("`@("`@.30R,C(N,C,V-S@S)))M-C(-"D5L96UE;G0@<V5T.B`@("`@(#,V#0I);F-L:6YA=&E0;CH@("`@("`@ M.3@N.#, V, 2!D96 < -"E)!(&]F(&Y09&4Z("`@("`@(#(T,"XV-3,T(&1E9PT*))))M16-C96YT<FEC:71Y.B'@("'P+C'P,30W-3'-"D%R9R!09B!P97)I9V5E.B'@ M(#(R,"XX,3(Y(&1E9PT*365A;B!A;F]M86QY.B`@("`@,3,Y+C\$Y,3,@9&5G M#0I-96%N(&U0=&E0;CH@("`Q-"XP,3,T-S8W-"!R97809&%Y#0I\$96-A>2!R M871E.B'@("'@("TR+COT92TP-B!R97809&%Y7C(-"D5P;V-H(')E=CH@("'@ M("`@("`@(#(P,3(W#0I#:&5C:W-U;3H@("`@("`@("`@("`@(#(Y,`T*#0I3)))))))M871E;&QI=&4Z(\$U%5"TR+S(P#0I#871A;&]G(&YU;6)E<CH@,C`X,C8-"D5P M; V-H('1I; 64Z("'@("'@.30R,C(N,3@U-#,W.#\$-"D5L96UE; G0@<V5T.B'@ M("`@.#(S#0I);F-L:6YA=&E0;CH@("`@("`@.#(N-3(V.2!D96<-"E)!(&]F M(&Y09&4Z("`@("`@(#\$P,RXP,CDW(&1E9PT*16-C96YT<FEC:71Y.B`@("`P M+C`P,3\$X.3<-"D%R9R!09B!P97)I9V5E.B`@(#(U.2XS.#`Y(&1E9PT*365A M;B!A;F]M86QY.B`@("`@,3`P+C8P,3\$@9&5G#0I-96%N(&U0=&E0;CH@("`Q M,RXX,S4X-S,W-2!R97809&%Y#0I\$96-A>2!R871E.B`@("`@("`@-"XR92TP M-R!R97809&%Y7C(-"D5P;V-H(')E=CH@("`@("`@("`@(#\$Y-3(R#0I#:&5C M:W-U;3H@("`@("`@("`@("`@(#,P,@T*#0I3871E;&QI=&4Z(\$U%5"TS+S0-F))M"D-A=&%L;V<@;G5M8F5R.B`R,3(S,@T*17!08V@@=&EM93H@("`@("`Y-#(R)))M,2XX,C8Y,C`X,OT*16QE;65N="!S970Z("`@("`W,C(-"DEN8VQI;F%T:6]N M.B`@("`@("`X,BXU-#,Y(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,3,0+C8X M,S`@9&5G#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`Q-#<Q,@T*07)G(&]F('!E)M<FEG964Z("`@(#4R+CDS.#(@9&5G#0I-96%N(&%N;VUA; 'DZ("`@("`S,#<N M,S`W-"!D96<-"DUE86X@;6]T:6]N.B`@(#\$S+C\$V-#8S.#@Q(')E=B]D87D-M"D1E8V%Y(')A=&4Z("`@("`@("`U+C%E+3`W(')E=B]D87E>,@T*17!08V@@ M<F5V.B`@("`@("`@("`@,34X-#\$-"D-H96-K<W5M.B`@("`@("`@("`@("`@("`@ M, C@P#OH-"E-A=&5L; &ET93H@3D]!02TQ, @T*0V%T86Q09R!N=6UB97(Z(#(Q)))M,C8S#0I%<&]C:"!T:6UE.B`@("`@(#DT,C(R+C<W.34Y,S8V#0I%;&5M96YT M('-E=#H@("`@(#\$S,OT*26YC;&EN871I;VXZ("`@("`@(#DX+C8Q-38@9&5G M#0I202!09B!N;V1E.B`@("`@("`R-#DN,S0X,R!D96<-"D5C8V5N=')I8VET M>3H@("`@,"XP,#\$T,#0S#0I!<F<@;V8@<&5R:6=E93H@("`@-S@N,#<S-"!D M96<- "DUE86X@86Y0;6%L>3H@("`@(#(X,BXR,#\$X(&1E9PT*365A;B!M;W1I M; VXZ("`@, 30N, C(T, S<V, #<@<F5V+V1A>0T*1&5C87D@<F%T93H@("`@("`@ M,2XU-64M,#8@<F5V+V1A>5XR#0I%<&]C:"!R978Z("`@("`@("`@("`Q-C@R M-@T*0VAE8VMS=6TZ("`@("`@("`@("`@("`S,#4-"@T*4V%T96QL:71E.B!-M150M,R\U#0I#871A;&]G(&YU;6)E<CH@,C\$V-34-"D5P;V-H('1I;64Z("`@ M("`@.30R,C`N-34Y,S`Q,CD-"D5L96UE;G0@<V5T.B`@("`@-S,P#0I);F-L M:6YA=&EO;CH@("`@("`@.#(N-34S."!D96<-"E)!(&]F(&Y09&4Z("`@("`@ M("`W.2XW-COU(&1E9PT*16-C96YT<FEC:71Y.B`@("`P+C`P,30W,S<-"D%R M9R!09B!P97)I9V5E.B`@("`V-"XP,#(P(&1E9PT*365A;B!A;F]M86QY.B`@ M("`@,CDV+C(V,C`@9&5G#0I-96%N(&UO=&EO;CH@("`Q,RXQ-C@S,S0Q,"!R M97809&%Y#0I\$96-A>2!R871E.B`@("`@("`@-2XQ92TP-R!R97809&%Y7C(-M"D5P;V-H(')E=CH@("`@("`@("`@(#\$T,S,U#0I#:&5C:W-U;3H@("`@("`@ M("`@("`@(#(X,0T*#0I3871E;&QI=&4Z(\$U%5"TR+S(Q#0I#871A;&]G(&YU)))M;6)E<CH@,C(W.#(-"D5P;V-H('1I;64Z("`@("`@.30R,C\$N.3`T,COR.3\$-M"D5L96UE;G0@<V5T.B`@("`@,S(T#0I);F-L:6YA=&E0;CH@("`@("`@.#(N M-30Y.2!D96<-"E)!(&]F(&Y09&4Z("`@("`@(#\$V,RXX-S\$S(&1E9PT*16-C M96YT<FEC:71Y.B'@("'P+C'P,COS,3,-"D%R9R!O9B!P97)I9V5E.B'@("'W M-"XX,C(S(&1E9PT*365A;B!A;F]M86QY.B`@("`@,C@U+C4V,C(@9&5G#0I-M96%N(&U0=&E0;CH@("`Q,RXX,S`Q,3(T,B!R97809&%Y#0I\$96-A>2!R871E M.B`@("`@("`M-BXP92TP."!R97809&%Y7C(-"D5P;V-H(')E=CH@("`@("`@ M("`@("`T-S4Q#0I#:&5C:W-U;3H@("`@("`@("`@("`@(#(X,`T*#0H015@-M"E-"(\$M%4%,@0"!!35-!5"`@)\$]20E,M,C(T+DT-"D]R8FET86P@16QE;65N M=',@(#(R-"Y-25-##0H-"DA2(\$%-4T%4(\$]20DE404P@14Q%345.5%,@1D]2 M(\$U!3DY%1"!!3D0@34E30T5,3\$%.14]54R!3051%3\$Q)5\$53#0I&4D]-(%=!

M-5%'1"!&3U)4(%=/4E1(+%18(\$%U9W5S="`Q,BP@,3DY-`T*ODE\$.B`D3U)" $M4RTR,CON3OT \pm 5$ \@040,(%)!1\$E/(\$%-051%55)3(\$)4#0H-"E-A=&5L;&ET M93H@4\$]3050-"D-A=&%L;V<@;G5M8F5R.B`R,C@R.OT*17!08V@@=&EM93H@M("'@("'Y-#(R,BXV-S0S.3(X, T*160E;65N="!S970Z("'@("'S,#4-"DEN M8VQI;F%T:6]N.B`@("`@("`Y."XV-#8X(&1E9PT*4D\$@;V8@;F]D93H@("`@ M("`@,CDX+C`P-#\$@9&5G#0I%8V-E;G1R:6-I='DZ("`@(#`N,#`Q,3`V,@T*)M07)G(&]F('!E<FEG964Z("`@(#,Y+C8Y-CD@9&5G#0I-96%N(&%N;VUA;'DZ M("'@("'S,C'N-3'R,2!D96<-"DUE86X@;6]T:6]N.B'@(#\$T+C(X,#,V,3'X $\label{eq:main_end} $$M(')E=B]D87D-"D1E8V%Y(')A=&4Z("`@("`Q+C1E+3`W(')E=B]D87E>$$ M, QT*17!08V@Q<F5V.B`Q("`Q("`Q("`Q(#OU-#<-"D-H96-K<W5M.B`Q("`QM("`@("`@,C@W#0H-"E-A=&5L;&ET93H@34E2#0I#871A;&]G(&YU;6)E M<CH@,38V,#D-"D5P;V-H('1I;64Z("`@("`@.30R,C\$N.3,T.#<Y-C(-"D5L M96UE;G0@<V5T.B`@("`@-S`T#0I);F-L:6YA=&EO;CH@("`@("`@-3\$N-COX M-R!D96<-"E)!(&]F(&Y09&4Z("`@("`@(#(W-RXU,#80(&1E9PT*16-C96YT M<FEC:71Y.B'@("'P+C'P,#\$S,S0-"D%R9R!09B!P97)I9V5E.B'@(#(P-2XP M-C8U(&1E9PT*365A;B!A;F]M86QY.B`@("`@,34U+C`R-30@9&5G#0I-96%N M(&U0=&E0;CH@("`Q-2XU-C<U-C8W."!R97809&%Y#0I\$96-A>2!R871E.B`@ M("`@(#\$N.3@Y92TP-2!R97809&%Y7C(-"D5P;V-H(')E=CH@("`@("`@("`@ M(#0X-#,Y#0I#:&5C:W-U;3H@("`@("`@("`@("`@(#,S-`T*#0I3871E;&QI M=&4Z(\$A50D),10T*0V%T86Q09R!N=6UB97(Z(#(P-3@P#0I%<&]C:"!T:6UEM.B'@("'@(#DT,C(Q+CDQ-C<W-COT#0I%;&5M96YT('-E=#H@("'@(#4Q-@T* M26YC;&EN871I;VXZ("`@("`@(#(X+COV.3D@9&5G#0I202!09B!N;V1E.B`@ M("`@("`R-3`N.#,T,B!D96<-"D5C8V5N=')I8VET>3H@("`@,"XP,#`U-S<V M#0I!<F<@;V8@<&5R:6=E93H@("`R.#DN-#(T-B!D96<-"DUE86X@86Y0;6%L M>3H@("`@("`W,"XU-S\$X(&1E9PT*365A;B!M;W1I;VXZ("`@,30N.3`V-3\$V M-3\$@<F5V+V1A>0T*1&5C87D@<F%T93H@("`@("`@,BXY,V4M,#8@<F5V+V1A M>5XR#0I%<&]C:"!R978Z("`@("`@("`@,S<T,OT*0VAE8VMS=6TZ("`@ $M("`@("`@("`S,34-"@T*4V%T96QL:71E.B!'4D\-"D-A=&%L;V<@;G5M)$ M8F5R.B`R,3(R-OT*17!08V@@=&EM93H@("`@("`Y-#(R,BXR,C`O-S@S,`T* M16QE;65N="!S970Z("`@("`Q,CO-"DEN8VQI;F%T:6]N.B`@("`@("`R."XT M-C,Q(&1E9PT*4D\$@;V8@;F]D93H@("`@("`@,C\$V+CDX,S0@9&5G#0I%8V-E M;G1R:6-I='DZ("`@(#`N,#`P,S8V.OT*07)G(&]F('!E<FEG964Z("`@,3\$S)M+C\$T,C4@9&5G#0I-96%N(&%N;VUA;'DZ("`@("`R-#8N.34V-B!D96<-"DUE M86X@;6]T:6]N.B`@(#\$U+COQ,3(U.#\$P(')E=B]D87D-"D1E8V%Y(')A=&4Z M("`@("`@,2XS.3!E+3`U(')E=B]D87E>,@T*17!08V@@<F5V.B`@("`@("`@M("`@(#8U,C@-"D-H96-K<W5M.B`@("`@("`@("`@("`@,C8W#0H-"E-A=&5L M;&ET93H@54%24PT*0V%T86Q09R!N=6UB97(Z(#(Q-S`Q#0I%<&]C:"!T:6UE M26YC;&EN871I;VXZ("`@("`@(#4V+CDX-C\$@9&5G#0I202!09B!N;V1E.B`@ M("`@("`R.3@N-3\$R."!D96<-"D5C8V5N=')I8VET>3H@("`@,"XP,#`U,S`R M#OI!<F<@; V8@<&5R:6=E93H@("`Q,3(N,C(W,B!D96<-"DUE86X@86YO;6%L M>3H@("`@(#(T-RXY,C8T(&1E9PT*365A;B!M;W1I;VXZ("`@,30N.38U-C@Q M,#`@<F5V+V1A>OT*1&5C87D@<F%T93H@("`@("TR+C`U-64M,#4@<F5V+V1A M>5XR#0I%<&]C:"!R978Z("`@("`@("`@("`O-3DQ-PT*0VAE8VMS=6TZ("`@ 8("`@("`@("`R.#0-"@T*+T58#0H:

End of Info-Hams Digest V94 #904 ***********